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COMPARISON OF EFFECTS OF PERSICA AND CHLORHEXIDINE GLUCONATE MOUTHWASHES ON GINGIVITIS AND PLAQUE FORMATION: AN ANIMAL STUDY

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ABSTRACT: Background: The efficacy of Persica mouthwash and chlorhexidine gluconate mouthwash in prevention of gingivitis and plaque formation was compared. Materials and Methods: A total of 60 randomly selected dogs visited in the Dr.Shamshiry Veterinary Clinic were considered for the study.The dogs divided into three groups of 20 subjects each one. Researchers applied Persica to group one, chlorhexidine gluconate mouthwash 0.2% to group two and finally in the control group, normal saline were used. The gingival index (GI) by Loe and Silness was recorded which was followed by Turesky- Gilmore-Glickman modification of Quigley Hein plaque index (TQHPI) on 0, 14 and 21 days. Results: Chlorhexidine and Persica showed a significant reduction in Plaque and gingival index scores from baseline to 14 and 21 days. However, the improvement in plaque and gingival index scores in chlorhexidine group was better than Persica. Conclusion: Herbal mouthwash of Persica was effective in reducing plaque accumulation and gingival inflammation and had no adverse effects, but Chlorhexidine still remains a gold standard.
Keywords: Chlorhexidine, Gingivitis, Mouthwash, Persica.

INTRODUCTION

Plaque-induced gingivitis continues to be a major dental and health problem (1-5)

Periodontal diseases are among the most common infectious diseases and can lead to destruction of the periodontal ligament, cementum, gingiva and alveolar bone. Plaque is the primary etiological factor in gingival inflammation(6). Thus, control of dental plaque holds the key to halt the progression of periodontal disease. (7) The most effective method of prevention and maintenance of periodontal disease is mechanical as well as chemical plaque control.(8) Chemical inhibitors of plaque play an important role in plaque control.(9)A variety of approaches have been considered for chemical plaque control.(10) mouthwashes are a simple and widely accepted method to deliver the anti-microbial agents.

Various synthetic chemical agents have been evaluated over the years with respect to their antimicrobial effect in oral cavity. Among the mouthwashes, chlorhexidine is considered as the gold standard.(11) This cationic bis-biguanide is the best known and most widely used member of the class of broad-spectrum antiseptics .(10) But, it cannot be used for a long duration because it has many side-effects like altered taste sensation and staining of tongue, brown discoloration of teeth, oral mucosal ulcerations and paresthesia; unilateral/bilateral parotid swelling, and enhanced supra-gingival calculus formation.(12,13,14)

Patients are going away of modern day medicines, and they prefer using herbal preparations which are efficient without causing any side effects.(10)

Persica herbal mouthwash contains three medicinal plants, Salvadora persica, Yarrow and Mint, and the plants are in the formulation oral drop of Persica and do not have the side effect of chemical substances, and it is an

advantage for it.(11,15) World Health Organization (WHO) has also recommended miswak plant as an effective tool for oral health.(16) Several studies evaluated antibacterial and antifungal effect of Persica. (17,18,19,20,21) Various clinical studies on comparison between chlorhexidine and Persica on periodontal pathogens and tooth decay have been conducted.(16,22,23) but non of them compare gingivitis and plaque formation after use of Persica and chlorhexidine gluconate mouthwashes, so this study was designed for this aim.

MATERIALS AND METHODS

This randomized animal study was conducted on 60 dogs were visited at Dr. Shamshiry Veterinary Clinic in Esfahan, Iran during 2013-2014 . At the start of the study period, baseline recordings were made . Following data were recorded :

1. Loe and Sillness Gingival index (1963) Muhlemann and Son's Sulcus(24)
2. Bleeding index (1971) Sillness and Loe
3. Plaque index (25)

All recordings were made by the same examiner. The random-number table was used for randomization. The dogs were divided to 3 group. Each group contains 20 dogs. Group A subjects were sprayed with 5ml of chlorhexidine gluconate 2% mouthwash (The product of ShahreDaru Pharmaceutical Company, Tehran, Iran with license production number of 019-SH-72) twice daily for 1 minute . Group B were sprayed with 5ml of herbal mouthwash Persica 10% (Manufactured by Poursina Pharmaceutical Company with the registration number of: 1228013232, Iran) twice-a-day for 1 minute. . Group C sprayed with 5 ml of normal saline (as the experimental/herbal mouthwash was also used only 5 ml as a concentrate) twice-a-day for 1 minute.

This regimen for each group was followed for 21 days. Recordings were made at 14th day and 21st day for all the subjects and were compared to baseline. GI, PI and bleeding index scores were re-evaluated on the 14th day and 21st day for all the subjects day by the same investigator who was unaware of the mouthwash used by the subject.

Gathered data was analyzed using SPSS version 18, independent and paired t-test analysis, chi-square test and repeated measure analyze. In this survey P-value less than 0.05 considered significant.

RESULTS

The purpose of this study was to compare the effects of Persica and chlorhexidine gluconate mouthwashes on gingivitis and plaque formation.

The results showed that both chlorhexidine and Persica mouthwashes could reduce mean plaque accumulation from baseline to 21st day. The mean Plaque index scores reduced from 4.2± 0.5 to 2.34±0.7 in chlorhexidine group and from 4.8± 0.64 to 3.2± 0.7 in the Persica group. But in normal saline group no significant change observed. (4.3±0.7 to 4.5±0.83)(Figure 1)

Analysis showed that chlorhexidine and Persica improved gingival scores from baseline to 14th day with further improvement on 21st day. The reduction in Gingival index scores in Chlorhexidine and Persica group was 3.0± 0.1 to 1.28± 0.3 and 2.8± 1.3 to 1.6±0.5 (from baseline to 21st day) respectively. But in normal saline group significant change was not occured.(2.7±0.7 to 2.5±0.64) (Figure 2).

Intergroup comparisons indicated that chlorhexidine was significantly more potent in reduction of plaque accumulation and gingivitis as compared to Persica.

Chlorhexidine and Persica could decrease bleeding sites. The mean percentage of bleeding sites decrease from 93.0± 25% to 61.2± 31% in chlorhexidine group and 92.6± 59.23% to 58.1± 43.5% in Persica group on 21st day.Again in normal saline group no significant changes was seen. (91.1 ±48.23 to 89±53.64)(Figure 3).

DISCUSSION

Periodontal disease is a major health problem. There is an increase in the use of mechanical and chemical plaque control agents to prevent periodontal disease. Various chemical mouthwashes are available but are associated with side-effects like immediate hypersensitivity reaction, toxicity, tooth staining, etc. Alternative medicines may be developed from medicinal plants as these plants contain natural phytochemicals, and hence, can replace synthetic drugs. (13,14.26)

The study was designed to determine the efficacy of herbal mouthwash, Persica, versus chlorhexidine mouthwash on gingival status and plaque biofilm accumulations over a period of 21 days. Chlorhexidine remains

the gold standard antiplaque and antigingivitis agents. Its effectiveness can be attributed to its bactericidal and bacteriostatic effects in the oral cavity. Numerous studies have reported the efficacy of chlorhexidine in reducing plaque accumulation and gingival inflammation. (27,28,29)
Persica has been shown to be effective in reducing bacterial count. (30,31)
Salehi and et`al s study showed that use of Persica can be helpful in orthodontics patients.(23) Paknezhad study indicated effectiveness of Persica on reducing pocket depth. (22)
Sofrata and colleagues understood Persica can increase PH of dental plaque and salivary flow of parotid glands so can reduce dental caries and the bacteria which have role in periodontal disease. (32,33)
Persica can prevent adhesion of bacteria to dental surface. (21,34,35)
In comparative study between Persica and chlorhexidine on human, it was demonstrated that chlorhexidine was highly efficacious in reducing bacterial count but Persica had less antibacterial effects. (22,36)
In our study Persica was effective on plaque index, gingival index and bleeding on probing but its effects were less than chlorhexidin.
Mozaffari and colleagues suggested in cases that use of chlorhexidin is contraindicated ,such as pregnant women ; Persica can be used, although it is less effective. (18).

CONCLUSION

Herbal mouthwash, Persica, can be used as an alternative to Chlorhexidine and can be prescribed for longer duration without any side effects for management of periodontal diseases.

APPENDIX

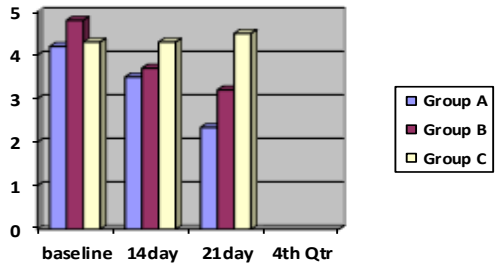

Figure 1: Plaque index scores in Chlorhexidine and Persica and Normal saline group

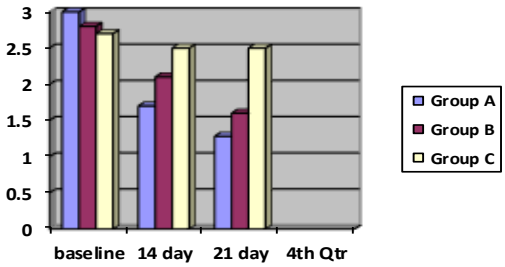

Figure 2: Gingival index scores in Chlorhexidine and Persica and Normal saline group

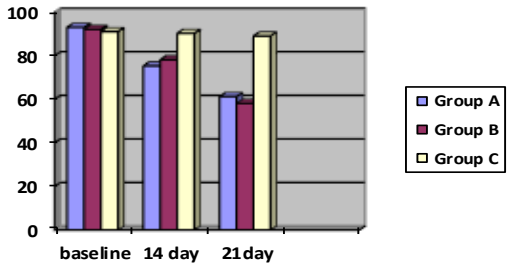

Figure 3: Mean percentage of bleeding sites in Chlorhexidine and Persica and Normal saline group

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